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Clinical Observations on Erosions
of the Stomach and Their
Treatment

BY

MAX EINHORN, M.D.

NEW YORK

Reprinted from the MEDICAL RECORD, *June 23, 1894*



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CLINICAL OBSERVATIONS ON EROSIONS OF THE STOMACH AND THEIR TREATMENT.

As is well known, the term "erosion" signifies a defect of superficial nature. In the stomach erosions are often found at the autopsy. Of late several valuable papers on the pathological anatomy of this subject and on the rare occurrence of erosions associated with typical ulcers of the stomach have been published.

In his excellent article, "Ueber geschwürige Processe im Magen," D. Gerhardt¹ describes erosions of the stomach in the following words: "Sections made of erosions as a rule show that at the base of the ulcerations almost the entire lower half of the mucous membrane is still preserved. In the epithelium of these remaining glands nothing remarkable can be discovered; at the sides the glands become longer; the first ones that are intact usually curve themselves over the defect and partly cover it. The recovery seems to take place by the simple after-growth of the gland remnants."

Virchow² maintains that besides circulatory derangements in the larger vessels of the stomach (art. coron., gastricae breves, and gastroepiploicae) the acute and chronic catarrh of the stomach, especially if the latter is accompanied with vomiting and crampy contractions, are the cause of bleeding ulcers and erosions of this organ.

O. Harttung³ in his article, "Ueber Faltenblutungen

¹ D. Gerhardt: Virchow Arch., Bd. 127, p. 85.

² R. Virchow: Virchow Arch., Bd. v., p. 363.

³ O. Harttung: Deutsche med. Wochenschr., 1890, No. 38, p. 847.

und hämorrhagische Erosionen," explains the origin of erosions in the following way: "The contraction of the muscularis of the stomach effects an arrest of the flow in the folds and intense congestion in the veins and capillaries which give cause to hemorrhages into the mucous membrane. . . . An hemorrhagic infiltration of the mucous membrane arises, which, therefore, is only little or not at all provided with fresh circulating blood and very soon succumbs to the digestive effect of the gastric juice. In this way the decay and destruction of the tissue, the hemorrhagic erosion is produced."

Langerhans¹ opposed the commonly accepted view that between erosion and ulcer of the stomach there is only a gradual but no typical difference, and that ulcers of the stomach very frequently originate from the larger erosions. He gave the following reasons: The round ulcer of the stomach has its typical location near the small curvature, and is met with only exceptionally at other places; the hemorrhagic erosions, on the contrary, have no predilection for their seat; the round ulcer appears most frequently as a single ulcer, sometimes as two corresponding ones, but very seldom in greater number; erosions, on the contrary, are met with in large numbers, seldom singly. They are located principally at the tops of the folds of the mucous membrane, and flow together, if they are very numerous and near each other, in the form of elongated and ramified figures corresponding to the folds of the mucous membrane; the round ulcer of the stomach loses its characteristic round shape only if two corresponding ulcers at both sides of the small curvature unite to form one oblong ulcer, the longitudinal diameter of which is always perpendicular to the longitudinal axis of the stomach.

Langerhans believes that primary affections of the vessels (aneurisms, embolics, etc.) are but very seldom the cause of hemorrhagic erosions, and that, on the other hand, catarrhal inflammations, with crampy contractions

¹ R. Langerhans: Virchow Arch., Bd. 124, p. 373.

of the muscularis, but exceptionally cause the formation of chronic corrosive ulcers. Ordinarily hemorrhagic erosions appear in crampy contractions accompanied with inflammatory processes, round ulcers of the stomach in primary affections of an arterial vessel. Only very exceptionally do erosions become transformed into chronic ulcers.

Such exceptional cases in which gastric ulcers very probably took their origin from erosions are described by Langerhans and Gerhardt in their previously mentioned papers.

Ewald,¹ speaking of the etiology of *ulcus rotundum ventriculi*, mentions also erosions as an important factor, and describes the microscopic picture of a stomach which has been treated according to Heidenhain's method shortly after death. The mucous membrane of this stomach was suffused with blood, and at different places the glandular tubules were filled to beyond their necks with unmistakable red blood-corpuscles. "A very slight local congestion or a traumatism," Ewald remarks at this place, "may be the cause of such bleedings. They develop into the hemorrhagic erosions, small, streak-like, or rounded losses of substance from the size of a millet-seed to that of a pea, on which at times a blackish-brown extravasation of blood is found, together with the simultaneous loosening of the mucous membrane. Their number is very variable, being sometimes enormous, especially near the pylorus, so that the stomach appears as if covered with them."

Whereas the subject in question has been thoroughly discussed and worked at in respect to the pathological anatomy in the aforementioned literature, very little has been done clinically. Although erosions of the mucous membranes of the stomach are mentioned in some textbooks, there is nowhere defined how these conditions may be recognized during life.

The only papers which in a slight measure touch the clinical side of this subject are the following :

¹ C. A. Ewald : Diseases of the Stomach, p. 236, 1892.

Jaworski and Korczynski¹ describe non-dangerous exfoliations of the gastric mucous membrane with traces of bleeding of the stomach caused by the tube; unless they originate from an artificially ruptured ulcer or cancer, they are never large, and confine themselves to the red coloration of a few portions of mucous membrane, and at the utmost to pink tinging of the washed stomach contents. These small artificial bleedings are different from other hemorrhages of the stomach; they are fresh and show under the microscope unchanged red blood corpuscles which are dissipated in the parenchyma of the mucous membrane. These artificial bleedings occur principally in patients suffering from chronic gastric catarrh (lack of HCl secretion), thus frequently in carcinomatous stomachs.

Boas² says, in his book on "Diseases of the Stomach:" "Sometimes when fasting there appears in the stomach contents also desquamated epithelium and remnants of glandular tubes. They are found oftener than could be concluded from the description given by other authors. In several instances I have observed clear fragments of glandular tubes which could be recognized with certainty." Boas also mentions the occurrence of small exfoliations of the mucous membrane. He speaks of them, however, as something accidental, which could be utilized for the diagnosis by microscopic examination.

Contrary to these described accidental occurrences of pieces of gastric mucous membrane, I have observed during the last two years seven patients in whom the presence of particles of the gastric mucous membrane in the washwater of the stomach was quite the rule. These cases resemble each other in so many respects that they appear as if belonging to one sickness. They could best be considered as erosions of the gastric mucous mem-

¹ Jaworski and Korczynski: Deutsche med. Wochenschrift, 1886, No. 49, p. 875.

² Boas: Allgemeine Diagnostik und Therapie der Magenkrankheiten, p. 171. Leipzig, 1890.

brane. It might be appropriate at first to describe these cases as they have been observed clinically, and thereafter to discuss the type of the disease.

CASE I.—June, 1892. M. S.—, thirty-four years of age, shoemaker, is for the last four years troubled with pains after meals. As a rule, the pains are not severe; sometimes, however, although quite seldom, they appear with intensity. Patient feels extremely weak and languid. Appetite ordinarily very poor, bowels constipated.

Status præsens: Strongly built man; mucous membranes well colored; cheeks hollow. Chest organs intact. Stomach not enlarged, sensitive to pressure, but not specially painful.

The examination of the stomach contents one hour after Ewald's test-breakfast, which has been repeatedly done, always showed absence of the free hydrochloric acid, presence of small quantities of combined HCl and ferments; not much mucus.

June 3.—When fasting: stomach empty; lavage: in the wash water there are found three red pieces of mucous membrane. (One small piece is examined in glycerin under the microscope and well-preserved glands found.) The stomach is sprayed with a one per mille silver nitrate solution.

June 5th.—Lavage: three red pieces of mucous membrane appear in the wash-water. Spray with argent. nitr.

June 7th.—Lavage: two red pieces of mucous membrane. Spray with argent. nitr.

June 10th.—Patient feels better. Lavage: no pieces of mucous membrane. Spray with argent. nitr.

June 13th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

June 16th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

The treatment is discontinued. Patient feels well almost a whole year, and lives without any complaints whatever. On July 4, 1893, patient consulted me anew. He asserted that he was troubled with poor appetite,

pains after meals, and extreme weakness for the last three to four weeks.

When fasting: stomach empty; lavage: two red pieces of mucous membrane are found in the wash-water; one of them being 1 ctm. long and 0.5 ctm. wide. Spray with argent. nitr.

July 6th.—Lavage: two red pieces of mucous membrane appear in the wash-water. Spray with argent. nitr.

July 8th.—Patient feels considerably better. Lavage: one red piece of mucous membrane. Spray with argent. nitr.

July 11th.—Lavage: no mucous membrane. Spray with argent. nitr.

July 14 and 17, 1893.—The same condition is noticed during lavage (*i.e.*, no pieces of mucous membrane appear), and the stomach sprayed with argent. nitr. Patient is dispensed from treatment.

CASE II.—January 12, 1893. M. G——, aged thirty, merchant, had influenza three years ago. Since that time patient began to suffer from digestive troubles; he used to vomit immediately after meals; patient once noticed in the vomited matter some thick, light, red blood, mixed with mucus (the quantity was one small liquor glass). Patient is troubled, besides, with pains in his back for ten years; these pains increased after the grippe. Poor appetite, no relish of food. Bowels always good. Patient is not much emaciated.

Status præsens: The chest organs do not show anything abnormal. The stomach reaches until about one finger's width above the navel. The gastric region is painful to pressure. The diagnosis was made probable ulcer of the stomach, and the patient subjected to the ordinary rest-treatment. Patient has been fed exclusively per rectum during the first week, and thereupon ordered a milk-diet for two weeks. During all this time warm flaxseed poultices have been applied. During this treatment, and also for some time thereafter, the vomiting stopped, and the pains were less severe when they

appeared. Soon, however, patient began to complain anew, and by the middle of February, 1893, all the old symptoms had reappeared.

February 25.—When fasting: the stomach is washed out (during the lavage of this morning as well as in almost all the following washings, more or less violent coughing and sometimes nausea spells appear). In the wash-water four pieces of mucous membrane (bloody red) are found. Spray with a one per mille nitrate of silver solution.

February 27th.—When fasting, lavage (during this procedure vehement coughing spell): in the wash-water four red pieces of mucous membrane are found; the wash-water has a slightly pink color (admixture of traces of blood). Spray with argent. nitr.

March 1st.—Lavage: in the wash-water four red pieces of mucous membrane; the water is slightly red, especially the last part of it (admixture of blood). Spray with argent. nitr.

March 3d.—Intra gastric galvanization.

March 5th.—Lavage: several pieces of blood-red mucous membrane. Spray with argent. nitr.

March 7th.—Patient feels better. The stomach is sprayed with argent. nitr.

March 9th.—When fasting, lavage: no pieces of mucous membrane; the wash-water, however, is a trace red. Spray with argent. nitr.

March 11th.—Spray with argent. nitr.

March 13th.—Lavage: one red piece of mucous membrane. Spray with argent. nitr.

March 15th.—Spray with argent. nitr.

March 17th.—Lavage: no pieces of mucous membrane in the wash-water.

March 19th.—Examination of the stomach contents one hour after Ewald's test-breakfast: $\text{HCl} = 0$; acidity = 4; no lactic acid; rennet ferment = 0; rennet zymogen +.

March 22d.—Spray with argent. nitr.

March 25th.—Patient complains of having more pains. Lavage: three red pieces of mucous membrane; in taking out the tube, some blood-red water appears. Spray with argent. nitr.

March 27th.—Spray with an ichthyol solution.

March 29th.—Spray with an ichthyol solution.

March 31st.—Patient does not feel any better. Lavage: several red colored pieces of mucous membrane. Spray with one per cent. alumnol solution.

April 2d and 4th.—Spray with alumnol.

April 6th.—Lavage; only one red piece of mucous membrane. In taking out the tube some bloody water appears. Spray with alumnol.

April 8th.—Spray with alumnol. As the patient did not improve by the local treatment, the same is for the present discontinued. The patient was given arsenic and iron for some time; his condition, however, did not seem to be influenced by these medicaments.

Besides the pieces of gastric mucous membrane, the wash-water (especially the last part which was emptied when taking out the tube) showed a slight red color. This gave ground to the supposition that the sore spots may be situated at the small curvature, probably not very distant from the cardia. As the patient offered a grave condition (inability to walk, extreme weariness, pains in the gastric region as well as principally in the back in the neighborhood of the seventh vertebra), it appeared to me (and also to one of the best surgeons of this city) that an operation (exploratory laparotomy), with the intention of an eventual excision of the erosions (if there should be only few of them) would possibly give some benefit.

The patient left for Germany and consulted several colleagues, but none advised an operation; he was sent to Kissingen, where he passed six weeks without any benefit, and finally returned to New York with his old complaints.

The examination of the patient on January 6, 1894, showed the conditions unchanged: When fasting, lavage:

three red pieces of mucous membrane appear in the wash-water; one of the pieces is 1 cm. long and 0.4 cm. wide, and shows several dark red ecchymoses of the size of the head of a pin; several microscopic specimens have been prepared, some in the fresh condition the others dried and stained; one can easily see the glandular tubes and certain places of group-wise accumulations of red blood-corpuscles (see Fig. 1); this latter being of a slightly red color.

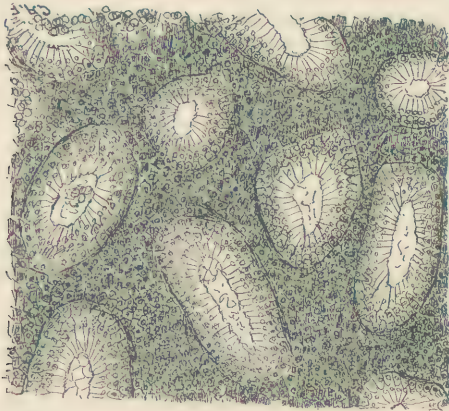


FIG. 1.—A piece of gastric mucosa (patient M. G—), showing the glands mostly vertically cut, and accumulations of red blood corpuscles on the lower right-hand corner.

CASE III —February 11, 1893.—H. S—, aged thirty-five, merchant, suffers for two to three years from digestive troubles. These consist principally in the appearance of pains right after meals; the pains are not severe; they produce, however, the effect that patient eats less. There is a feeling of fulness; bowels constipated. Patient always feels weak and tired.

The examination reveals: chest organs intact; the gastric region is sensitive to pressure; there is splashing

sound extending two fingers'-width below the navel; right kidney movable.

The examination of the stomach contents one hour after Ewald's test-breakfast showed: HCl + ; acidity = 60.

February 13th.—When fasting: stomach empty. Lavage: in the wash-water three small red pieces of mucous membrane are found. Spray with argent. nitr.

February 14th.—Intra gastric galvanization.

February 15th.—Lavage: in the wash-water three small red pieces of mucous membrane appear. A fresh microscopic specimen shows gastric glands. Spray with argent. nitr.

February 16th.—Patient feels better—*i.e.*, he is stronger, can eat more, and is not troubled with pains. Direct galvanization of the stomach.

February 17th.—Lavage: no pieces of mucous membrane are found. Spray with argent. nitr.

February 18th.—Intra gastric galvanization.

February 19th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

February 20th.—Intra gastric galvanization.

February 21st.—Examination of the stomach contents one hour after the test-breakfast: HCl + ; acidity = 54; no pieces of mucous membrane.

February 22d.—Direct galvanization of the stomach.

February 23d.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

February 24th.—Intra gastric galvanization. Patient had to return to his native city, Chicago, on account of urgent business. As I have recently heard, patient felt well all the time with but few intervals.

CASE IV.—April 24, 1893. L. A——, aged thirty-three, merchant, suffered for two to three years from temporary attacks of pains right after meals. The pains are not of a severe nature; they, however, have a depressing effect on patient and cause him to partake of much less

food than he is otherwise used to. The bowels are only slightly costive. The periods of pains extend over about two to three months and are then followed by periods of complete euphoria. For a month the patient has pains after meals; the appetite is poor, and frequently a feeling of extreme weakness overcomes the patient.

Status præsens: Chest organs do not reveal anything abnormal. The gastric region is sensitive to pressure, but there is no distinct pain. After the partaking of half a glassful of water, a splashing sound can be produced extending to two fingers'-width above the navel.

April 27th.—The stomach contents are examined one hour after the test breakfast: HCl +; acidity = 30.

Patient was given nux vomica and gastro-faradized three times, but without showing any improvement.

May 9th.—When fasting, lavage: four red pieces of gastric mucous membrane appear in the wash water. Spray with a one per mille nitrate of silver solution.

May 11th.—When fasting, lavage: four red pieces of mucous membrane are found in the wash-water. Spray with argent. nitr.

May 13th.—Intra gastric galvanization.

May 15th.—When fasting, lavage: one piece of mucous membrane is found in the wash-water. Spray with argent. nitr.

May 17th.—Intra gastric galvanization.

May 19th.—When fasting, lavage: no pieces of mucous membrane in the wash water. Patient feels much better and leaves for the country.

CASE V.—April 19, 1893.—B. M. S——, aged twenty-six, merchant, complains for two and a half years of digestive troubles. At first patient had lack of appetite, pains after meals, and nausea, but no vomiting. Feeling of weariness and fatigue; constipation. After some continued treatment and a trip to the South the condition of the patient improved for a while; soon, however, it got worse again. During the last two years patient has constantly pains right after meals, with but very few excep-

tions, and feels very weak. When fasting, patient, as a rule, feels well.

Status præsens: Chest organs intact; the gastric region is sensitive to pressure. After drinking half a glassful of water a splashing sound can be produced, extending to one to two fingers'-width above the navel. Liver not enlarged. Urine contains neither sugar nor albumin.

April 20th.—Examination of the stomach contents one hour after Ewald's test-breakfast shows: HCl +; acidity = 60; admixture of much mucus.

Diagnosis: Gastritis gland. chron. mucosa.

April 21st.—When fasting, stomach empty, lavage: in the wash water, three red pieces of gastric mucous membrane. (A fresh specimen in glycerine shows gastric glands.) Spray with arg. nit.

April 23d.—Intra-gastric galvanization.

April 25th.—Lavage: three red pieces of mucous membrane appear in the wash-water. Spray with argent. nitr.

April 27th and 29th.—Direct galvanization of the stomach. Patient had to leave New York on account of business and returned on May 17th.

May 18th.—When fasting, stomach empty, lavage: three red pieces of mucous membrane are found in the wash-water. Spray with argent. nitr.

May 20th.—Intra gastric galvanization.

May 22d.—Lavage: two red pieces of mucous membrane are found. Spray with arg. nitr.

May 24th.—Patient feels better, has a better appetite, and hardly any pain. Lavage: no pieces of mucous membrane are found. Spray with argent. nitr.

May 26th.—Direct galvanization of the stomach.

May 30th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

June 2.—Intra-gastric galvanization. Patient feels well and is, therefore, for the present dismissed.

CASE VI.—August 24, 1893.—G. B.—, aged thirty-

two, merchant, complains for about ten years from digestive troubles. Appetite is seldom good; after meals patient has a slight painful feeling in the gastric region. Bowels almost always constipated. Off and on there appears a feeling of extreme fatigue to such a degree that patient is hardly able to walk. There was never vomiting, but very frequently much belching. Flat taste in the mouth, and, at times, highly increased salivation. Patient has been in Carlsbad several times, but without any benefit.

Status præsens: Chest organs intact. The gastric region sensitive to pressure, but not considerably painful. Splashing sound after the partaking of half a glassful of water extending to three fingers'-width above the navel.

August 26th.—The examination of the stomach contents one hour after Ewald's test-breakfast shows: $\text{HCl} = 0$; acidity = 24; Rennet ferment +; very much viscid mucous.

Diagnosis: Gastritis gland. chron. mucosa.

Treatment: Strychnia and iron; besides extr. fluid. Cascar. sagrad.

Patient then left for his native city, Altoona, but returned to New York at the beginning of November, in order to undergo treatment.

November 2d.—When fasting, stomach empty, lavage: in the wash water, much mucus and two red pieces of gastric mucosa. Spray with argent. nitr.

November 4th.—Direct galvanization of the stomach.

November 6th.—Lavage: two red pieces of mucous membrane. Spray with argent. nitr.

November 8th.—Patient feels better; he can eat more and feels stronger. The examination of the stomach contents one hour after the test-breakfast shows: $\text{HCl} +$; acidity = 52.

November 11th.—Direct galvanization of the stomach.

November 14th.—Lavage: no pieces of mucous membrane found. Spray with argent. nitr.

November 17th.—Intra gastric galvanization.

November 19th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

November 22d.—Direct galvanization of the stomach.

November 24th.—Lavage: no pieces of mucous membrane. Spray with argent. nitr.

November 26th.—Intra-gastric galvanization.

Patient feels better and returns home.

CASE VII.—May 20, 1893. J. J. M——, thirty six years of age, pharmacist, began to suffer from digestive troubles five years ago. Appetite was very poor. Patient ate only, as he expressed himself, “from habit.” Tongue thickly coated. Frequently dizziness and darkness in front of the eyes. This latter symptom often appeared so violently that the patient had to stop work for fifteen to twenty minutes, in order to recuperate. Fatigue and general weakness. Bowels always constipated. Feeling of pressure in the gastric region, only seldom increasing after meals.

Besides these general symptoms, patient two to three times yearly had attacks growing worse. These attacks were as follows: at night patient fell asleep with the feeling of extreme fatigue; at 2 A.M. he used to wake up with a strong irritation in the throat and in the œsophagus and spat constantly thick mucus. This condition (*i.e.*, the uninterrupted spitting) used to last frequently until 4 A.M. or 4.30 A.M., and patient nearly always was obliged to provoke vomiting by tickling his throat in order to get relief. These attacks of deterioration used to last three to six weeks. During such an attack patient came under my care.

Status præsens: Slender man with very thin panniculus adiposus; cheeks somewhat hollow. Chest organs intact. The gastric region is somewhat sensitive to pressure, but no intense pain can be produced at any place. There is a splashing sound extending to one to two finger's-width above the navel. Tongue heavily coated. Knee-jerk present, perhaps somewhat increased. Patient

can stand with eyes closed. Urine does not contain any sugar nor albumin.

The examination of the stomach contents on May 21st, one hour after Ewald's test-breakfast, showed: $\text{HCl} +$; acidity = 96; lactic acid not present.

Diagnosis: hyperacidity. Treatment: alkalies; richly albuminous diet.

May 23d.—When fasting, stomach empty, lavage: in the wash-water three red pieces of gastric mucosa are found. Spray with one per mille nitrate of silver solution.

May 25th.—Intra gastric galvanization.

May 27th.—Lavage: in the wash-water two red pieces of mucous membrane. (One small piece examined under the microscope in the fresh state shows gastric glands.) Spray with argent. nitr.

May 29th.—Direct galvanization of the stomach.

May 31st.—Lavage: no pieces of mucous membrane are found. Spray with argent. nitr.

June 2d.—Direct galvanization of the stomach. Patient has a good appetite and feels much stronger. The feeling of pressure has disappeared and sleep is good. Further treatment is therefore dispensed with.

In summing up all the cases described one is confronted with the following striking points: In washing the stomach when the patient is in the fasting condition 1 to 4 small pieces of gastric mucous membrane are found. They are about 0.3 to 0.4 ctm. long and nearly as wide, and present a blood-red color. Under the microscope one sees well-preserved glands and accumulations of red blood corpuscles. These pieces of gastric mucosa are constantly found if the stomach of the patient is washed out in the fasting condition. We have not to deal here with an incidental lesion caused by the tube, for, on the one hand, the lavage has been performed without any aspiration and by means of a soft tube; on the other hand, one could not observe in a casual lesion that constancy which is found here.

Besides this objective point in the patients mentioned, several subjective symptoms appear with particular clearness, namely: pains, emaciation, feeling of weakness.

The pains, as a rule, are not intense, and make their appearance right after meals, no matter what has been eaten. They last various lengths of time (one to two hours), and then gradually disappear. Complaints of severe attacks of pains we have never met with in these cases. Frequently there appear, for periods of different lengths, intervals perfectly free from pains, combined with a feeling of complete euphoria. Only seldom do the patients feel pains all the time without reference to food.

Emaciation.—Most cases observed lost in flesh during the first period of their sickness, but thereafter kept up their weight quite constantly. They looked rather thin (in the face the jaws protrude, the cheeks are thin and somewhat hollow), but did not, however, present that cachectic color we are accustomed to meet in carcinoma and other grave chronic troubles.

Feeling of Weakness.—All the patients complained of a feeling of lassitude, weakness, lack of ambition, and inability to work, and of a decrease of bodily strength. This symptom appears most markedly right after meals, and decreases somewhat a little while afterward (one-half to one hour). In one of my patients (G. B——) there usually appeared, once in a week or in a fortnight, an acme of this symptom, associated with complete anorexia, and lasted for about two days. During this period of deterioration patient was hardly able to walk.

What is the Condition of the Gastric Juice in the Cases Described?—In the first six, one encounters a decrease in the HCl secretion and in the acidity of the stomach contents. In two of these cases (G. B—— and B. M. S——), there was always found a considerable amount of mucus. In all these cases the diagnosis has been made: "Gastritis gland. chronica," in the two last,

"Gastritis gland. chron. mucosa." In the seventh case (J. J. M——), however, there was found superacidity caused by an increased HCl secretion.

How are We to Explain the Constant Occurrence of the Small Pieces of Gastric Mucosa?—In six of the cases narrated blood was never found in the wash water carrying the small pieces of mucous membrane. Only in one patient (M. G——), the wash water often used to have a very slight red color. In this case coughing spells frequently appeared during lavage, and in such an instance, besides the pieces of gastric mucosa, the water was stained slightly red.

The pieces of gastric mucosa found in the wash-water of our patients probably must have partly or wholly peeled off from the mucous membrane of the stomach some time previous to the washing. This would explain why there is no bleeding during the lavage. The spots on which the exfoliations have taken place and thus present "erosions," might explain the soreness met with in our patients. One can also easily understand the appearance of blood from the sore spots caused by violent contractions of the stomach during a coughing spell (in case M. G——).

It is very difficult, or perhaps at present hardly possible to decide, whether the exfoliations always take place at the same spots—the mucous membrane constantly becoming replaced and peeled off again—or whether the whole (or a great part) of the inner surface of the stomach is affected in such a manner that small pieces of mucosa easily peel off here and there. This question can only be answered after a long study of vast clinical and pathologico anatomical material. These exfoliations take place (whether always on the same or on different spots) day by day in the stomach of our patients, and effect temporary erosions.

In all cases mentioned, similar in so many points, one constantly encounters the exfoliations of the gastric mucosa, respectively the resulting erosions. Therefore this

pathological condition might be most suitably termed "Erosions of the stomach."¹

Etiology.—In the greatest number of cases mentioned there was found chronic gastric catarrh associated with erosions. The same probably gave cause to the origin of the latter anomaly. Some cases of erosions of the stomach may, however, be caused by some factors yet unknown.

Course.—The course of this pathological condition is a very prolonged one. Several of the patients appear to



FIG. 2.—Gastric Spray Apparatus.

have suffered from it for many years. Although there may be intervals of perfect euphoria (at the same time probably the inner layer of the stomach is completely intact) for a longer or shorter period of time, the old symptoms do, however, sooner or later return.

One would imagine that cases of erosions of the stomach would present a very fruitful soil for the development of ulcers. This, however, does not seem to be the case. For in none of the patients (with the only ex

¹ REMARK.—We prefer the term "Erosions of the stomach" instead of the more correct but longer name, "Erosions of the gastric mucosa," as there is no fear of any misunderstanding.

ception perhaps of M. G——), was there any justifiable supposition of an existing ulcer during the long course of the sickness.

Treatment.—The local treatment of the stomach here plays a great rôle. The astringent effect of nitrate of silver solutions in similar more accessible affections led me to apply this substance directly to the inside of the stomach. This can best be achieved by means of the spray. It was on this occasion that I constructed the gastric spray apparatus (see Fig. 2), and recommended its use in the field of diseases of the stomach.¹

The treatment is given in the following way: First, the stomach in a fasting condition is washed out with lukewarm water; when all the water has been emptied, the tube is removed from the stomach. The spray apparatus is filled with 10 c.c. of a 1 to 2 per mille solution of nitrate of silver, the tube end dipped into warm water and inserted into the stomach (length of tubing 50 cm.); thereupon the whole, or at least the greater part of the solution in the bottle is sprayed; the bottle is then opened and the spray-tube removed from the stomach.

In fact the good result of this method of treatment can frequently be best shown in the affection in question. For after the spraying has been done several times the small pieces of gastric mucosa cease to appear. Associated with the objective symptom there appears an amelioration in the subjective feeling of the patient; the pains grow considerably less or entirely disappear, and the strength increases.

I usually combine the spray-nitrate of silver treatment with intra-gastric galvanization; alternately applying the spray or the galvanization. The reason for the use of galvanization in these cases lies in the fact that I had such effective results in two other cases of probable erosions of the stomach, complicated with heart trouble,² by means of galvanization alone. The methodical application of in-

¹ M. Einhorn: New York Medical Journal, September, 1892.

² Max Einhorn: New York Medical Journal, July 8, 1893.

tra-gastric galvanization combined with the spray seems to increase the curative effect.

As to diet, there is no need for being very rigorous in these cases. Frequent meals, avoiding heavy vegetables, salads, and pastries, is all I ordinarily require.

Cold ablutions, light gymnastics, out-door life are to be warmly recommended.

Of medicaments condurango and nux vomica are frequently, and a good, easily assimilated iron preparation always, appropriate.

Although these medicaments may be of value as adjuvants, we should rely, in my opinion, mainly upon the local treatment.

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